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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/527,512

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Alexander Schluttig

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05/27/2009

WOMBLE CARLYLE SANDRIDGE & RICE, PLLC

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EXAMINER

BARCENA, CARLOS

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/527,512	<b>Applicant(s)</b> SCHLUTTIG ET AL.	
	<b>Examiner</b> Carlos Barcena	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 16,17,19-22,24-26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16,17,19-22, 24-26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The amendment filed 05/14/2009 has been entered. Claims 16-17, 19-22, 24-26, and 28-30 remain pending. Claims 18, 23, and 27 have been canceled
2. The previous objection to the specification has been withdrawn. The terms “phosphorous”, “neutralised”, and “pK” are deemed acceptable terms.
3. The previous objection of claim 16 has been withdrawn in light of Applicant's amendment to the claim.
4. The previous 35 USC 112, first and second paragraphs, rejection of claim 16 has been withdrawn in light of Applicant's amendment to the claim.
5. The previous 35 USC 103(a) rejection of claims 20 and 21 over McArthur (4,039,471) in view of Mross *et al.* (4,529,714) has been withdraw as discussed in section *Response to Arguments*. However, upon further consideration, a new ground(s) of rejection is made in view of Dittmer *et al.* (6,241,826). All other claims remained rejected as follows.

### ***Claim Rejections - 35 USC § 102***

6. **Claims 16-17, 19, 22, 24, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by McArthur (4,039,471).**

Regarding claims 16 and 19, McArthur discloses a process for rejuvenating automobile emission control (denox, col. 2, lines 52-54) catalysts poisoned with compounds of lead and/or phosphorus comprising:

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- (i) treating the catalyst in the presence of a substantially aqueous solution of water-soluble, alkalinely reacting alkaline earth salts, ammonium hydroxide or alkalinely reacting ammonium salts, or water-soluble organic amines with (col. 10, lines 40-41) with an ultrasonic treatment or low-frequency oscillations (col. 3, lines 44-49), and
- (ii) neutralizing by a subsequent treatment with inorganic or organic acids to regenerate the catalyst (col. 4, 11-12).

The preferred aqueous solvent is an ammonium salt (col. 4, lines 7-9). The agitation of the pump serves as the low-frequency oscillations. The inorganic acid is acetic acid (col. 4, line 11-12).

Regarding claim 17, McArthur discloses the ammonium and/or acetate salt being selected from the class consisting of ammonium chloride, ammonium nitrate, ammonium sulfate, ammonium acetate, ammonium citrate, ammonium carbonate, sodium acetate, potassium acetate, calcium acetate and magnesium acetate (claim 7b, col. 11, lines 33-38).

Regarding claim 22, McArthur discloses contacting the catalyst with the aqueous alkaline solution at a temperature of 20 °C (room temperature) to the boiling point of the salt solution (col. 10, line 42-43). In example I, step (i) takes place at 94 °C (col. 5, lines 54-60).

Regarding claim 24, McArthur discloses the solvent is agitated by means of a recycle pump (col. 3, lines 44-49). In example I, the aqueous solution is circulated through the catalyst (col. 5, lines 54-60).

Regarding claim 29, McArthur discloses a final water wash after the catalyst was contacted with dilute acetic acid and subsequently oven dried at 110 °C for 3 h (col. 9, lines 13-15). The rinsing of the catalyst can also be water (col. 4, lines 11-13).

***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**8. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McArthur (4,039,471) in view of Dittmer *et al.* (6,241,826).**

Regarding claims 20 and 21, McArthur teaches an alkaline treat using ammonium salts and acidic treatment solution per instant claim 1 (see above).

McArthur does not teach the further step of adding anionic, cationic, amphoteric, non-ionic or zwitterionic surfactants, wherein the amounts are between 0.01 wt.% and 0.1 wt.%.

Dittmer teaches a process for regenerating catalytic converters (denox, col. 1, lines 1-14) poisoned with phosphorus compounds (col. 1, lines 32-33), including the additions detergents, cationic or anionic surfactants in concentrations of 0.001 vol.% to 0.1 vol.% (col. 5, lines 12-13).

It would have been obvious to one of ordinary skill in the art at the time of invention to add cationic or anionic surfactants as taught by Dittmer in order to reduce surface tension (col. 5, lines 9-11) and allow for improved removal of contaminants.

It also would have been obvious to one of ordinary skill in the art at the time of the invention to add the surfactants in amounts of between 0.01 wt.% and 0.1 wt.% because a *prima facie* case of obviousness exists in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art”. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, “[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient

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to establish a *prima facie* case of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05[R-5].

**9. Claim 25-26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over McArthur (4,039,471) in view of Budin *et al.* (US 6,484,733 B2).**

Regarding claims 25 and 26, McArthur discloses a method for the regeneration of a denox catalyst using agitation (low-frequency oscillations) from a pump.

McArthur is silent as to the oscillation frequency (20 to 1000 Hz) and does not teach using ultrasound is used with 10,000 to 100,000 Hz or 20,000 to 50,000 Hz..

Budin discloses a process for regenerating used denox catalytic converters and teaches using acoustic irradiation in two different ranges (low-frequency and ultrasound), specifically, low-frequency oscillations less than 20 Hz and ultrasound greater than 20,000 Hz in constant or pulsed amplitude (col.4, lines 20-23).

It would have been obvious to one of ordinary skill in the art at the time of invention to perform the process of Mc Arthur including the use of an ultrasonication step motivated by Budin. The motivation for doing so would have been to more completely clean the catalyst by ejecting the compounds (contaminants) from the pores of the catalyst (Budin, col. 4, lines 25-27).

It also would have been obvious to one of ordinary skill in the art at the time of the invention to use the frequency range as recited in instant claims 25 and 26 because a *prima facie* case of obviousness exists in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art". *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, "[ A ] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient

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to establish a *prima facie* case of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05[R-5].

Regarding claim 28, McArthur does not specifically teach subjecting the catalyst to a mechanical pretreatment step to remove fine dust or pretreatment with water.

Budin does teach a mechanical abrasion of the outermost layer may be carried out prior to the regeneration of the catalyst in order to remove compounds which are coarsely adhering to the catalyst surface, such as for example dust, or the use of other mechanical means such as suction, blowing, sandblasting, brushing or the like (col.4, lines 35-40).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of McArthur to include a pretreatment step as taught by Budin. The motivation for doing so would have been to removing any contaminant compounds adhered to the catalyst before entering the alkaline solution. This would (1) remove some of the loosely adhered contaminants and (2) extend the life of the alkaline solution.

**10. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over McArthur (4,039,471) in view of Nojima (6,395,665).**

McArthur teaches heating the catalyst with reducing components to reactivate the deactivated catalyst (col. 4, lines 22-54).

McArthur does not teach re-impregnating the activator elements with water-soluble compounds after washing and drying the catalyst.

Nojima teaches a similar method of cleaning a denitration (denox) catalyst with aqueous alkaline solution to remove substances deposited thereon. Nojima discloses after washing and

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drying, the catalyst is impregnated with the active component prepared from aqueous solutions (col.5, lines 19-25).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Mc Arthur and incorporate the step as taught by Nojima. Nojima describes that when the catalyst are subjected an alkali cleaning treatment, catalytically active components may be dissolved out from the catalyst, thus causing a reduction in denitration power due to a decrease in the active metal concentration in the catalyst (col. 5, line 11-23). The motivation for re-impregnating the activator elements with water-soluble compounds would have been to return the catalyst back to its original catalytic levels. As such, it would be advantageous to adjust the active metal component concentration in the catalyst to its level before regeneration (col. 5, lines 20-23).

### ***Response to Arguments***

11. Applicant's arguments, see Remarks (bottom page 6, top page 7), filed 05/14/2009, with respect to the rejection(s) of claim(s) 20 and 21 under 35 USC 103(a) have been fully considered and are persuasive. The rejection is withdrawn due to Dittmer *et al.* (6,241,826) being non-analogous art.

12. Applicant argues McArthur does not teach ultrasonic treatment or low-frequency oscillations. However, the use of a pump to provide agitation reads on Applicant's claim and does provide low-frequency oscillations during the regeneration process.

13. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on



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combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues Budin does not disclose performing ultrasonic treatment during washing with an alkaline step. This step is specifically taught by McArthur. Furthermore, Budin discloses the washing solution further comprises lyes making the solution alkaline (col. 5, line 15-16).

Similarly, Applicant argues Nojima does not teach an alkaline solution with ultrasonic or low-frequency treatment. This oscillation step is specifically taught by McArthur. Nojima teaches cleaning denox catalysts with an alkaline solution (col. 2, lines 54-64) followed by neutralization with an inorganic or organic acid (col. 4, line 48-58).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Barcena whose telephone number is (571) 270-5780. The examiner can normally be reached on Monday through Thursday 8AM - 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENZO/  
Supervisory Patent Examiner, Art Unit 1793

/C. B./  
Examiner, Art Unit 1793